

CLAIMS:

1. A method of managing transportation demand and capacity, comprising:
- creating a network flow model comprised of a plurality of nodes, each node
- 5 representing a specific location;
- calculating the duals of a dual linear program based on the network flow
- model to determine the marginal value of a unit of capacity at a source node and the
- marginal value of a unit of capacity at a destination node;
- calculating the value of transporting a load from the source node to a
- 10 destination node based on the marginal values of a unit of capacity at the source node
- and destination node; and
- making a transportation decision based on the calculated value of transporting
- the load.
- 15 2. The method of claim 1, wherein the network flow model is comprised of a
- plurality of nodes, each representing a specific location at a specific time.
3. The method of claim 2, wherein the source node and the destination node are
- connected by an arc, the arc having a variable associated with the arc, the variable
- 20 representing a number of units of capacity to be moved between the source node and
- the destination node.

4. The method of claim 3, wherein the network flow model includes constraints at each node representing conservation of flow.

5. The method of claim 4, wherein the arc has an upper bound representing the demand for loads to be transported between the source node and the destination node, and the arc has a lower bound representing commitments for loads to be transported between the source node and the destination node.

6. The method of claim 5, further comprising:
forecasting the demand between the source node and the destination node based on historical data.

7. The method of claim 5, wherein the arc has an associated average revenue and average cost.

8. The method of claim 2, further comprising:
solving the dual of a linear program associated with the network flow model to determine the marginal value of a unit of capacity at the source node and the marginal value of a unit of capacity at the destination node.

9. The method of claim 2, wherein the source node and the destination node are connected by a plurality of arcs, each arc having an associated revenue and an associated cost.

10. The method of claim 2, further comprising:

creating a matrix containing the marginal value of a unit of capacity at each node in the network flow model up to a predetermined time in the future.

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11. The method of claim 10, further comprising:

periodically updating the matrix values by resolving the duals of a linear program associated with the network flow model.

10 12. The method of claim 11, further comprising:

calculating the profitability of transporting a given load from A to B according to the equation: $\text{profitability} = \text{Revenue} - \text{Cost} - \text{Val}(A) + \text{Val}(B)$, wherein $\text{Val}(A)$ and $\text{Val}(B)$ are the marginal value of a unit of capacity at location A and location B, respectively.

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13. The method of claim 12, wherein the marginal values of a unit of capacity are obtained from the matrix.

14. The method of claim 13, further comprising:

20 using the profitability calculation to make at least one of the following transportation decisions:

a) deciding whether or not to accept an offer to transport a load at a specified contracted price over a specified time period;

- b) prioritizing a plurality of offers to transport loads based on profitability;
- c) determining a contracted price to offer for transporting a load;
- d) determining a price to offer a shipper, for soliciting the shipper to transport a load by an idle unit of capacity;
- e) determining a spot price for transporting a load;
- f) selecting a mode of one of solo, team, rail, third party, regional or Canadian; and
- g) assigning a specific unit of capacity and a specific driver to a particular load.

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15. The method of claim 13, further comprising:

- searching a database containing a plurality of offers to have loads shipped;
- determining the profitability of each offer; and
- prioritizing the offers based on profitability.

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16. The method of claim 15, further comprising:

- spidering a database connected to a network to search for offers.

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17. The method of claim 1, wherein the transportation decision is used in a scenario evaluator.

18. A method of managing transportation demand and capacity, comprising:

creating a matrix containing the marginal value of a unit of capacity at each node in a network flow model up to a predetermined time in the future by solving the duals of a linear program associated with the network flow model;

periodically updating the marginal values in the matrix by resolving the duals
5 of a linear program associated with the network flow model;

calculating the profitability of transporting a load based on the marginal value of a unit of a capacity at a source node and the marginal value of a unit of capacity at a destination node; and

making a transportation decision based on the profitability calculation.
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19. A method of managing transportation demand and capacity, comprising:

calculating the marginal value of a unit of capacity at a source node and a destination node in a network flow model by solving the duals of a linear program associated with the network flow model;

15 calculating the profitability of transporting a load based on the marginal value of a unit of a capacity at the source node and the marginal value of a unit of capacity at the destination node; and

making a transportation decision based on the profitability calculation.